

Role of social institutions in shaping vegetable consumption across Africa: a review

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ABSTRACT

Increasing vegetable consumption is being promoted as a critical step towards more nutritious and sustainable diets. Despite the recognition that context shapes food consumption practices, there have been limited systematic analyses of the role of social institutions in enabling or hindering consumption of vegetables. In particular, we focus on cultural, cognitive, socioeconomic, and contextual influences that shape local understandings, attitudes, and practices surrounding health and wellbeing. We seek to address this knowledge gap by exploring whether and how academic research has engaged this issue, with a particular focus on Africa. The analysis finds that a range of social institutions play a role in shaping vegetable consumption. Most publications focus on cultural norms and personal perceptions and beliefs, the latter also reflecting one's cultural conditioning and social positioning. Contextual factors such as education and economic status have been reported as having either positive or negative effects on vegetable consumption, depending on context. In terms of types of vegetables affected, traditional vegetables are featured more frequently rather than exotic (externally introduced) ones. The results of this analysis may contribute to informing agricultural and food security policies and programs aimed at promoting vegetable consumption in Africa.

1. Introduction

Vegetable consumption is vital for health and well-being (Ocean et al., 2019; Wallace et al., 2020; Wickham et al., 2020). Vegetables are rich in nutrients and provide important protection against non-communicable diseases and chronic diseases (Aune et al., 2017; Saxe-Custack et al., 2022; Yip et al., 2019). In Sub-Saharan Africa (SSA), about a hundred Traditional African Vegetable cultivars, alongside externally introduced vegetables - Exotic Vegetables, contribute to nutritional diversity and livelihood security (Towns and Shackleton 2018). Despite this potential in SSA, fruit and vegetable consumption per capita appears to be far below (268 g), the daily intake recommended (400 g), resulting in high numbers of people living with unbalanced and unhealthy diets (Mensah et al., 2021; Mason-D' Croz et al., 2019; Willett et al., 2019).

Increasing vegetable consumption is important for a shift towards healthier and more sustainable diets. Consequently, development

policies and agencies seek to stimulate fruit and vegetable production and consumption through various interventions and investments (Clark et al., 2018; Sandhu 2021). These initiatives, however, tend to prioritize supply-side over demand-side issues (Kuo et al., 2020; Pandohee et al., 2023; Tian et al., 2021). In doing so, they reiterate a conventional and common agricultural development approach that centers on technological change over engagement with the institutional context (Bulah et al., 2023; Jänicke 2012).

Levels and trends of vegetable consumption show variation over time and across regions of the world (Ansai and Wambogo 2021; Hosking and Campbell-Lendrum 2012; Woodside et al., 2013). While vegetable consumption in SSA has increased over the past 30 years, there is considerable variability across the continent (Mensah et al., 2021). Cultural influences - such as the association of traditional vegetables with poverty status and famine foods - also play a role (Mngomezulu et al., 2022; Imathiu 2021). Despite growing recognition of how social context influences food choices (Higgs and Ruddock 2020; Robinson

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Table 1
Boolean search strings developed for literature identification.

Search strategy
#1. Vegetable: (vegetable OR veggie OR "garden produce" OR greens OR veg OR "vegetable* diet" OR "vegetable* food" OR "vegetable crop" OR "vegetable* dish*" OR "vegetable legume")
#2. Consumer behaviour: (consum* OR intake OR uptake OR purchas* OR choice* OR utili* OR demand* OR habit OR behavi* OR diet OR "willing* to pay" OR "willing* to buy")
#3. Institutions: ("institution" OR "soft institution" OR "informal institution" OR "social institution" OR "informal law" OR norm* OR tradition* OR cultur* OR "cultur* heritage" OR "dietary heritage" OR religio* OR ethni* OR trib* OR restriction OR prohibit* OR "interdi* alimenta*" OR belief OR perception OR heritage OR taboo OR rule OR "social value" OR "cultural value" OR worship OR myth OR practice OR media OR "informal regulat*")
#4. Africa: (Afric* OR Algeria OR Angola OR Benin OR Botswana OR "Burkina Faso" OR Burundi OR "Cape Verde" OR Cameroon OR "Central African Republic" OR Chad OR Congo OR "Democratic Republic of Congo" OR "Cote d'Ivoire" OR Djibouti OR Egypt* OR "Equatorial Guinea" OR Eritrea OR Eswatini OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR "Guinea-Bissau" OR Kenya OR Lesotho OR Liberia OR Libya OR Malawi OR Mali OR Mauritania OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Rwanda OR Senegal OR "Sahrawi Arab Democratic Republic" OR "Sierra Leone" OR Somali* OR "South Africa" OR "South Sudan" OR Sudan OR Tanzania OR Togo OR Tunisia OR Uganda OR Zambia OR Zimbabwe).
#5. #1 AND #2 AND #3 AND #4

et al., 2013; Stadlmayr et al., 2023), there has been limited research to identify how it is affected by social institutions, particularly in the case of "soft" institutions. The latter is defined as "*ideas, social and cultural norms, rules and routinized practices, emerging within a particular socio-cultural environment*" (Wiener 2006: 427), in contrast to "hard" institutions, namely formalized rules, laws, and policies. A recent study documenting a range of factors enabling or constraining vegetable consumption in SSA highlights the role of sociocultural drivers, such as education, wealth status, market networks, and gender norms (Stadlmayr et al., 2023). However, this review did not address social institutions, attributes and values that shape vegetable consumption (Locks et al., 2015), as we seek to do here.

The contribution of this analysis to vegetable research and development programs is twofold. First, it balances the current emphasis on technologies in agricultural interventions, in general, and specifically in vegetable production development programs. Second, research to date on the influence of social institutions has produced mixed findings. For example, research results related to efforts to alter people's attitudes and practices have shown a diversity of outcomes (Karpyn et al., 2020;

Mazariegos et al., 2016; Melnyk et al., 2022). While marketing campaigns to stimulate vegetable consumption have demonstrated limited impacts (Hendrie et al., 2024), automated messages designed to increase fruit and vegetable consumption have shown significant changes in vegetable intake (Kothe et al., 2012). Therefore, we analyze published literature around these questions: (i) what are the key social institutions influencing vegetable consumption practices in Africa? (ii) what types of vegetables are influenced by social institutions? (iii) how and to what extent do these institutions enable or constrain consumption patterns? We expect that this work will extend the current knowledge base and ensure that the design of agricultural and food security policies and programs will integrate a better understanding of the social context.

2. Social institutions and consumption practices

There is considerable consensus across the academic literature that cultural, social, economic, and environmental contexts shape food consumption practices (Martínez-Vargas et al., 2022; Melnyk et al., 2022; Story et al., 2002). This context includes social institutions, which

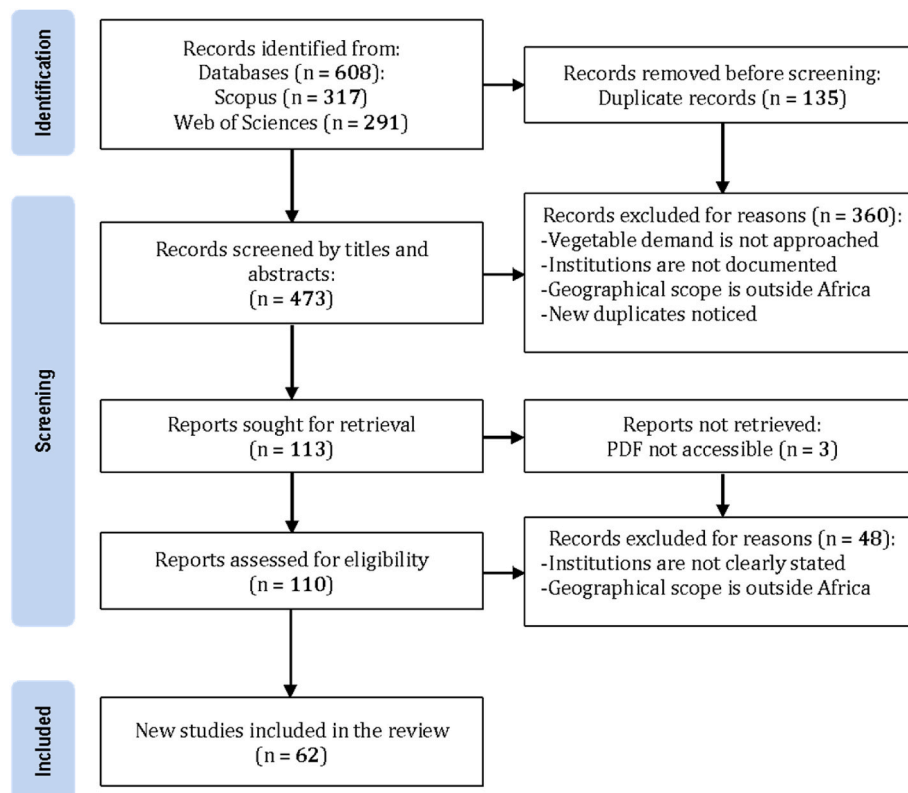


Fig. 1. Flow diagram of literature selection process.

are defined in this study as a dynamic assemblage of cultural understandings, beliefs, values, norms, and habits embedded in a web of historical legacies (Hodgson 2006; McAllister 2016). This article focuses on the social institutions that either promote or hinder vegetable consumption in Africa, with the goal of leveraging their role to foster increased vegetable consumption.

The interplay between social institutions and vegetable consumption is analyzed through the lens of a multi-dimensional social-ecological model (Locher and Sharkey 2009; Story et al., 2002; Ziegler et al., 2021). The latter defines the social-ecological contexts as a set of four interacting layers, namely the individual, social, physical, and macrosystem dimensions (see Table 2). The *individual* (or intrapersonal) dimension encompasses education and knowledge, attitudes, skills, beliefs, etc, that each person possesses. The *social dimension* includes family, friends, peers, networks, social structures and hierarchies. The *physical dimension* refers to food markets and vendors, and other infrastructures that condition food choices and consumption practices. The *macrosystem dimension* includes cultural norms, religious norms, and the media. For the purpose of this study, we followed a modified version of this framework, considering individual factors, social influences, and macrosystem influences.

To date, there is no systematic assessment of the role of social institutions in vegetable consumption practices in Africa. This paper explores how social institutions contribute to shaping vegetable consumption practices to determine why initiatives aimed to foster vegetable consumption have fallen short of desired impacts and why estimates of vegetable consumption in the region remain far below WHO recommendations.

3. Research design and methods

3.1. Search strategy and eligibility criteria

To understand how existing literature articulates social institutions shaping vegetable consumption practices in Africa, we performed a systematic literature review following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) (Yepes-Nuñez et al., 2021). We carried out the search in January 2023, using two bibliographic databases, Scopus and ISI Web of Science (WoS). The search considered all peer-reviewed articles, book chapters, and conference papers available in the search engines at the time of the search with no time period restriction. We combined different search terms related to “vegetable”, “consumption practices”, “social institution”, and “Africa” (see full description in Table 1).

Following the framework elaborated by Giddens (1986) on social institutions and structuration on the one hand and the set of criteria developed by Martin (2004) to track social institutions on the other hand, we adopted eight types of social institutions (see Table 2).

Further, we focus on vegetable consumption and procurement practices, the latter including production and purchasing. We considered academic literature in English and French that were indexed (title, abstract and keywords) in the selected databases, searching by title-abstract-keywords (Scopus) and topic (WoS) as field tags. French-speaking co-authors coded French publications. The preliminary search yielded 317 records from Scopus (294 in English and 23 in French) and 291 from WoS (266 in English and 25 in French) (Fig. 1). After deduplication in EndNote X9 (Hupe 2019), a total of 473 publications (441 in English and in 32 French) were uploaded onto SysRev (Bozada et al., 2021) for systematic and automated screening and data extraction.

Papers were screened in three steps: (i) title and abstract screening to assess whether the item met the review criteria, (ii) reading the full article when the first step did not provide adequate information to warrant its inclusion in the review, and (iii) retrieval of included publications.

Studies were included if they met the following criteria: (i) scholarly

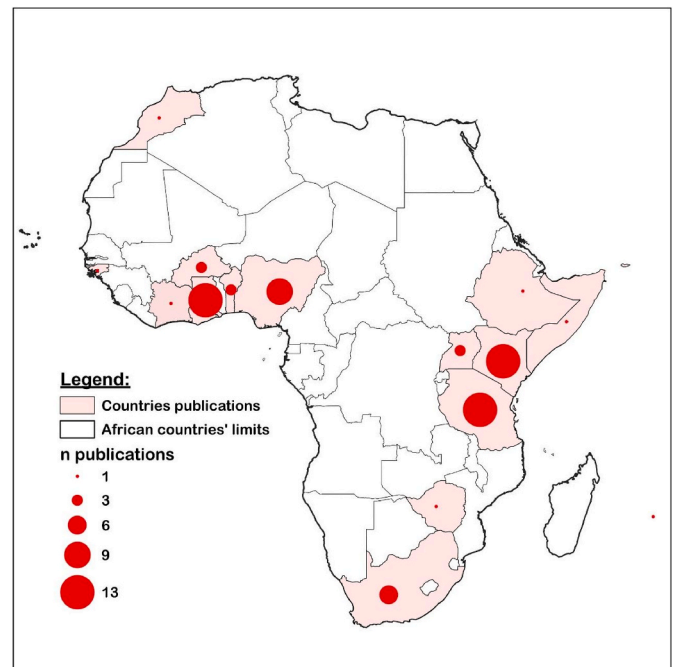


Fig. 2. Spatial pattern of included literature.

articles, reviews, book chapters, and conference papers; (ii) publications in English or French; (iii) research on vegetable consumption; (iv) studies addressing social institutions in relation to vegetable consumption; (v) geographical scope is Africa. Following independent screening for eligibility by the first two authors, 62 articles were deemed eligible, all written in English, except one that was in French (Fig. 1).

3.2. Data collection and analysis

After the screening, data were selected from each of the included literature based on the following variables: (i) authors, (ii) publication year, (iii) geographic scope, (iv) types of social institutions shaping vegetable consumption practices (religious norms, cultural norms, family and kinship, education, civil society organizations (CSOs) informal and formal rules, media representations, economic institutions, personal perceptions and beliefs), (v) influence of each institution, that is whether they enable or constraint vegetable consumption practices, and (vi) types of vegetable whose consumption practices are shaped by social institutions reported in the reviewed publications.

As for the analysis regarding the types of vegetables concerned by these social institutions (variable vi), we purposely extracted the data based on a vegetable typology, including Traditional African Vegetables and Exotic Vegetables as defined by Towns and Shackleton (2018), recognizing that social institutions may differently affect consumption practices of these vegetables. The illustrative sequences of variables iv to vi were annotated from the manuscripts on the SysRev platform. We then exported the selected statements to a MS Excel spreadsheet for data analysis. We used descriptive statistics to map the spatial and temporal distribution of the articles analyzed as well as to identify differences across institution and vegetable types across the institution-related statements.

4. Findings

4.1. Spatial and temporal patterns

Overall, most of the reported cases of social institutions affecting vegetable consumption examined in this review are from Western (42%) and Eastern Africa (41%), followed by Southern Africa (16%). The

Table 2
Typology of social institutions according to Martin (2004) and McAllister (2016).

Levels of influence	Typology of social institutions	Description
Individual dimension	Personal perception or belief	Mental states, conditions, strong conviction or acceptance that influence one's own behaviours, thoughts, and feelings, or the ways in which one sees and understands things.
	Education	Transfer of knowledge, skills, and values from one individual or group to another in either way, including adult education (or continuing education), special education, formal and informal education.
	Economic status	Mechanisms through which most humans satisfy their needs in society; they regulate the availability of goods and services that help meet some elements of survival, safety and security, belonging, and growth and achievement from Maslow's hierarchy.
Social dimension	Family and kinship	A relationship between two or more people who are related by birth, marriage, or adoption, including extended family members (grandparents, aunts, uncles, cousins), long-time friends, friends of family, or other individuals who are not related by blood or marriage; this institution facilitates learning about the world and the importance of love, care, and a sense of belonging.
Macrosystem dimension	Cultural norms	Shared beliefs or values and the human behaviours that support these values within social groups (ethnic group, tribe, human race, etc.), such as the standards of conduct that are met with social approval or disapproval.
	Religious norms	Various belief systems are supported by religious organizations; they regulate societal behaviours and individual choices in a religious group; they promote solidarity, emotional support, social cohesion, and social control and serve as an instrument for socialisation.
	Local or civil society organizations (CSO) regulations	Norms and regulations that shape the functioning of local, non-profit and non-governmental entities (including informal ones) providing services to individuals and mostly relying on volunteers to support minimal full-time staff.
	Media	Channels of communication, such as television, newspapers, internet reporting, social media, and magazines that disseminate information to small or large audiences.

greatest number of papers (21% of articles) was recorded for Ghana, followed by Kenya and Tanzania (17% each), Nigeria (16%), South Africa counting for 10%, Benin, Burkina Faso and Uganda (3% each), and Zimbabwe, Somalia, Morocco, Guinea-Bissau, Mauritius and Ethiopia (2% each) (Fig. 2). The relative equivalence in case distribution between West and East Africa may be a function of similarities in livelihood systems across those regions, where traditional vegetables are prominent in daily diets. In Southern Africa, traditional vegetables are

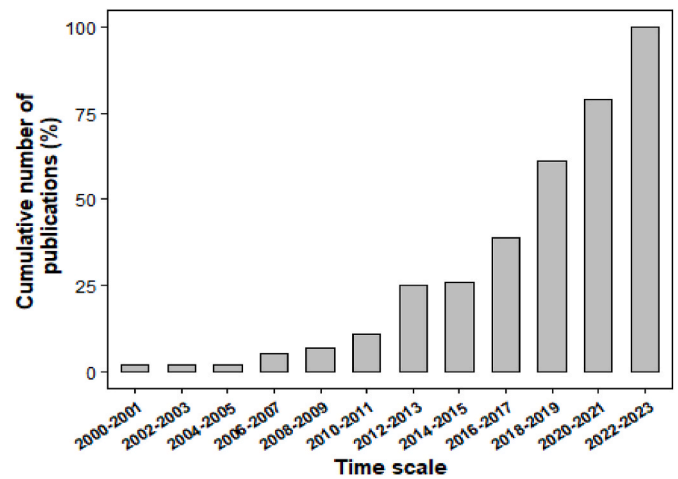


Fig. 3. Temporal pattern of included literature.

also common in diets, but there are fewer articles on how social institutions shape vegetable consumption practices. Among the few publications on North Africa, most were addressing the role of social institutions in the consumption of traditional vegetables rather than of Exotic Vegetables. This might partly explain why the review yielded fewer references from North Africa, given the greater prevalence of Exotic Vegetables in that region, possibly due to greater European influence (Heine 2004). Table 2

Engagement of social institutions in the reviewed literature on vegetable consumption in Africa appears to be a relatively recent phenomenon. The first article captured in our review was published in 2000 (i.e., Chweya and Almekinders (2000)), with the number of publications rapidly increasing in recent years. Of the 62 reviewed articles, nearly two-thirds (61.29%) were published after 2017 (Fig. 3).

4.2. Social institutions influences on vegetable consumption

The review identifies various types of social institutions affecting vegetable consumption. We extracted 320 relevant statements from the 62 papers reviewed (Fig. 4 and Supplementary Material 1 showing the distribution across articles). Nearly one-third of the selected statements (39%) referred to cultural norms shaping vegetable consumption practices, particularly in Kenya, South Africa, Tanzania, Ghana, and Nigeria (Fig. 5).

Personal perceptions and beliefs were the second highest number of social institutions influencing vegetable consumption practices (70, 22%). They were documented in literature focusing on Ghana, Nigeria, South Africa, Kenya, and Tanzania (Figs. 4 and 5). Education influences (12%) were also mentioned in relation to Ghana and Nigeria and, to a lesser extent, from Uganda and Tanzania (Figs. 4 and 5). Wealth status (11%) was also mentioned, particularly for Ghana, South Africa, Tanzania and Nigeria (Figs. 4 and 5).

4.3. Types of social institutions

Although the publications mention a diversity of social institutions, the analysis shows considerable variation across all African countries. For example, Nigeria, Tanzania, South Africa, and Ghana account for a greater percentage of statements discussing the influence of social institutions on vegetable consumption practices (Fig. 5).

About 125 of the selected statements on social institutions refer to cultural norms (Table 3). They can enable or hinder vegetable consumption practices. For instance, 76 statements about cultural norms (61%) are associated with increased vegetable consumption practices. For example, in western Kenya, the spider plant (*Chlorophytum comosum*) is regularly consumed by expectant mothers to stimulate milk

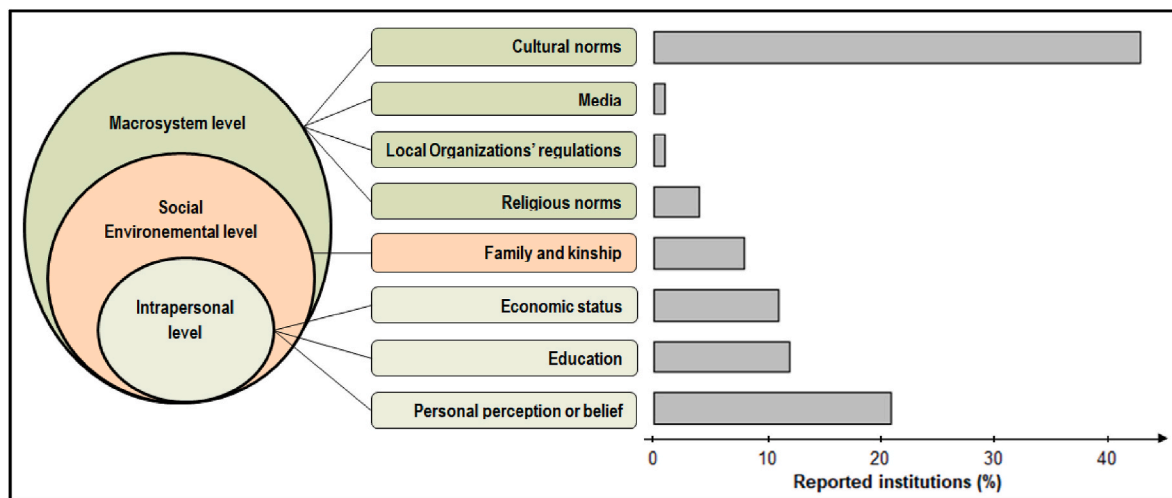


Fig. 4. Reported social institutions influencing vegetable consumption practices in Africa.

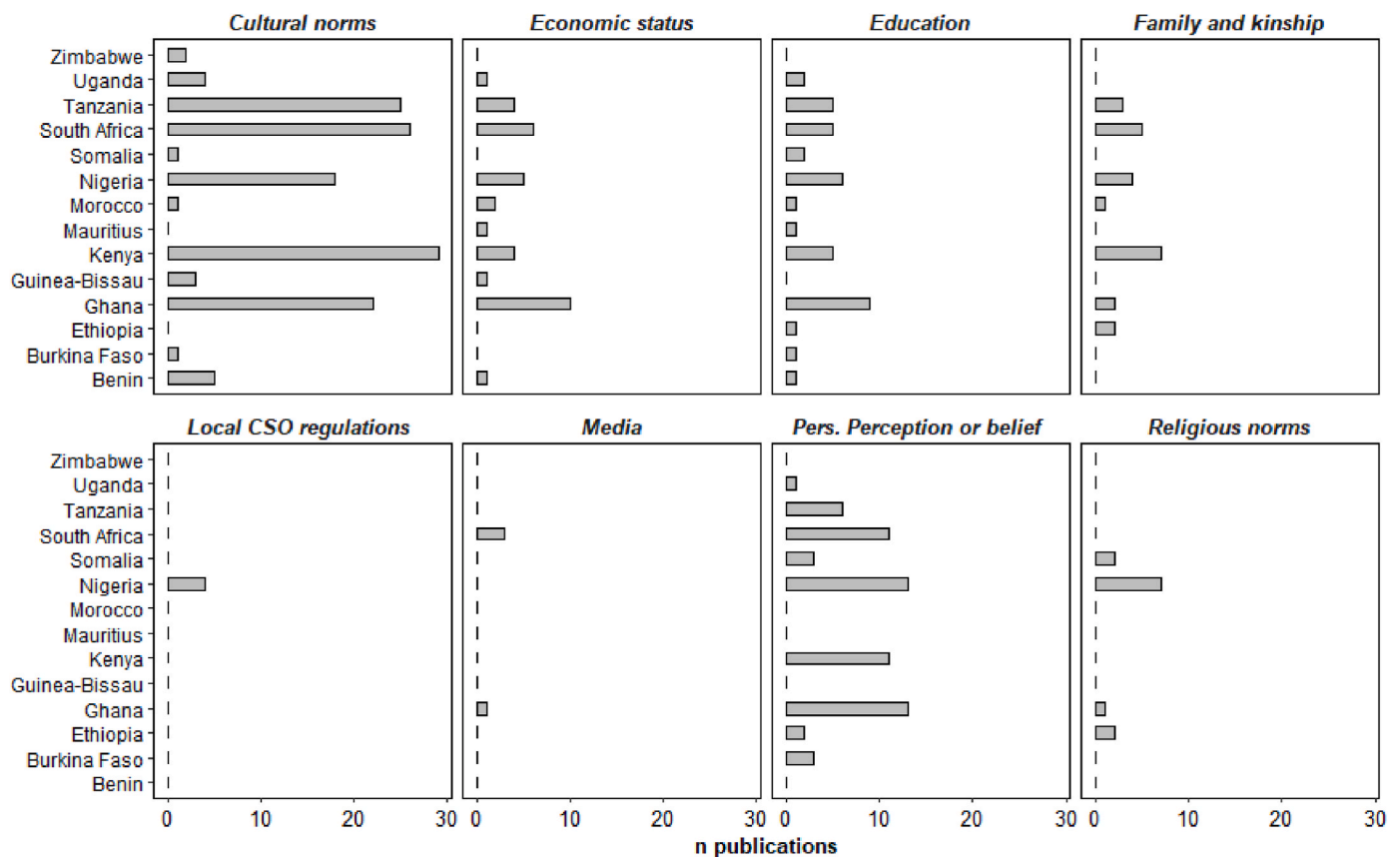


Fig. 5. Spatial distribution of reported social institutions influencing vegetable consumption practices.

production (Onyango et al., 2013). The plan is also believed to enhance blood production and ensure good health. A study of the consumption practices of Ghanaians' indigenous vegetables and perceived benefits reports also reflects the importance of cultural beliefs, though with multidirectional influences. On the one hand, some respondents stated that "the consumption of okra and cocoyam leaves [...] boost sperm production", which motivated men to consume them, even though there is no scientific evidence (Atuna et al., 2022: 8). On the other hand, among the Xhosa of South Africa, men undergoing circumcision initiations (*ulwaluko*) are not allowed to eat pumpkin leaves (Mngomezulu et al., 2022). Across southern Africa, where masculinity is closely linked to

meat consumption (Asamane et al., 2021), circumcised men may only eat vegetables after consuming raw meat, thereby establishing their maturity and masculinity.

Of the 70 selected statements that mention personal perceptions and beliefs, nearly half (49%) were identified as hindering vegetable consumption (Table 3). For example, in parts of Nigeria, vegetables are deemed to be food for goats and not for humans (Odukoya et al., 2022). Several statements relative to personal convictions centered on negative health effects. In the Dagbon (northern Ghana), okra and baobab leaves consumption are believed to induce back and joint pains (Atuna et al., 2022), while in Kenya, eating Traditional African Vegetables is thought

Table 3
Most frequently mentioned vegetable species whose demand is shaped by social institutions.

Social institutions	Type of vegetables	Frequency ^a	Vegetable species mostly mentioned	References
Cultural norms	Traditional African Vegetables	94	Spider plant (<i>Cleome gynandra</i>), amaranth (<i>Amaranthus</i> spp), African kale, horned melon (<i>Cucumis metuliferus</i>), African nightshade (<i>Solanum villosum</i>), maroon cucumber (<i>Cucumis anguria</i>), gusha (<i>Corchorus tridens</i>), Amaranthus hybridus, sweet potatoes (<i>Ipomoea Batatas</i>), muboora (<i>Cucurbita maxima</i>), munyemba leaves (<i>Vigna unguiculata</i>), Amaranthus spp, Celosia spp, pumpkin leaves (<i>Cucurbita moschata</i>), Morogo, jute mallow (<i>Corchorus olitorius</i>), baobab leaves (<i>Adansonia digitata</i>), garden egg, African eggplant, eggplant, slender leaf (<i>Crotalaria ochroleuca</i>), intufeshe (<i>Ethiopian kale</i>), Amaranthus graecizan, sorrel (<i>Hibiscus sabdariffa</i>), <i>Hibiscus rosella</i> , <i>Xanthosoma mafafa</i> (cocoyam leaves), nightshade (<i>Solanum scabrum</i>), bitter leaf plant (<i>Vernonia amygdalina</i>), okra (<i>Abelmoschus</i> spp), eku petere (<i>Ceratotheca sesamoides</i>) Ethiopian mustard, Telfairia occidentalis (<i>ugwu/ftuted pumpkin</i>), Mokiki (<i>Momordica foetida</i>)	Achigan-Dako et al. (2011); (Atuna et al., 2022; Aura, 2013; Bvenura and Sivakumar 2017; Chacha and Laswai 2020; Ejoh et al., 2021; Giddens, 1986; Hama-Ba et al., 2017; Kessy et al., 2018; Knisley and Nyomora, 2007; Lawal et al., 2021a; Macheke et al., 2022; Mason-D'Croz et al., 2019; Merchant et al., 2022; Mncwango et al., 2020; Mngomezulu et al., 2022; Ochieng et al., 2018; Onyango et al., 2013; Quaye et al., 2009; Roothaert et al., 2020; Zivkovic et al., 2022)
	Exotic Vegetables	13	Cabbages, potatoes, tomatoes, onions, small sweet peppers, hot peppers, carrots, bell peppers, cucumber, baby corn, green beans, and garden egg, lettuce, spring onion, cauliflower, sweet pepper, chili pepper	(Abass et al., 2017; Chacha and Laswai 2020; Lomira et al., 2021; Mngomezulu et al., 2022; Oyedele et al., 2018; Raaijmakers et al., 2018)
Family and kinship	Traditional African Vegetables	12	Cowpeas (<i>Vigna unguiculata</i>), amaranths (<i>Amaranthus blitum</i>), slender leaf (<i>Crotalaria ochroleuca</i>), African nightshade (<i>Solanum villosum</i>), jute mallow (<i>Corchorus olitorius</i>), pumpkin leaves (<i>Cucurbita moschata</i>) and spider plant (<i>Cleome gynandra</i>), Sunga (<i>Launea cornuta</i>), Kikundembala (<i>Vigna vexillata</i>), Mokiki (<i>Momordica foetida</i>), Inyiri (<i>Basella alba</i>)	(Aura, 2013; Chacha and Laswai 2020)
	Exotic Vegetables	4	Tomato (<i>Solanum lycopersicum</i> L.), cucumber (<i>Cucumis sativus</i> L.), and bell pepper (<i>Capsicum annuum</i> L.), cabbage, eggplant, pumpkin leaves, spinach	(Aboaba et al. (2022)
Education & environmental influence	Traditional African Vegetables	9	Okra (<i>Abelmoschus callei</i>), jute mallow (<i>Corchorus olitorius</i>) leaves, sorrel (<i>Hibiscus sabdariffa</i>) leaves, bean (<i>Vigna unguiculata</i>) leaves, amaranth, spider plant (<i>Cleome gynandra</i>), blackjack	(Hama-Ba et al., 2017; Mncwango et al., 2020; Zulu et al., 2022)
	Exotic Vegetables	6	Tomato (<i>Solanum lycopersicum</i> L.), cucumber (<i>Cucumis sativus</i> L.), bell pepper (<i>Capsicum annuum</i> L.), watermelon, lettuce, green pepper, eggplant, onion.	(Aboaba et al., 2022; Etuah et al., 2022; Owusu and Owusu, 2013)
Media	Traditional African Vegetables	0	NA	NA
	Exotic Vegetables	2	Onions, moringa, ginger, garlic	Mngomezulu et al. (2022)
Economic institutions	Traditional African Vegetables	12	Dried and crushed leaves of <i>Adansonia digitata</i> , <i>Bombax costatum</i> , and <i>Sesamum radiatum</i> , Cassava leaves	(Catarino et al., 2019)
	Exotic Vegetables	10	Tomato, cucumber, bell pepper watermelon, lettuce, carrots, onions, small sweet peppers, hot peppers, baby corn, green beans, garden egg, pumpkin, spinach, cabbage, spring, green pepper	(Aboaba et al., 2022; Adenegan et al., 2018; Coulibaly et al., 2011; Etuah et al., 2022; Owusu; Owusu, 2013; Probst et al., 2010; Raaijmakers et al., 2018; Zulu et al., 2022)
Personal perception & belief	Traditional African Vegetables	28	Ethiopian mustard, spider plant, nightshade, sunga (<i>Launea cornuta</i>), Kikundembala (<i>Vigna vexillata</i>), Mokiki (<i>Momordica foetida</i>), Inyiri (<i>Basella alba</i>), pumpkin leaves, blackjack, <i>Amaranthus spinosus</i> , <i>Corchorus olitorius</i> , <i>Tetragonia decumbens</i> , <i>Acokanthera schimperii</i> , cassava leaves	(Chacha and Laswai 2020; Cobbinah et al., 2018; Merchant et al., 2022; Mncwango et al., 2020; Mngomezulu et al., 2022; Nimoh et al., 2018; Zivkovic et al., 2022; Zulu et al., 2022)
	Exotic Vegetables	14	Cabbage, amaranth, eggplant, pumpkin leaves, spinach, tomatoes, onions, small sweet peppers, hot peppers, carrots, bell peppers, cucumber, baby corn, cabbage, green beans, garden egg, lettuce, spring onion, green pepper	(Abass et al., 2017; Chacha and Laswai 2020; Chweya and Almekinders 2000; Cobbinah et al., 2018; Kini et al., 2020; Probst et al., 2010; Raaijmakers et al., 2018)

Note.

^a Number of reported socio-institutional narratives that targeted a given type of vegetable.

to cause allergies, digestive disorders, and other health problems (Merchant et al., 2022). In South Africa, the consumption of local leafy vegetables is also believed to be associated with stomach ailments (Mncwango et al., 2020).

Analyzed statements emphasize the importance of socioeconomic factors in shaping vegetable consumption, with nearly two-thirds (64%) of statements that address wealth status stressing its enabling effect. For example, Raaijmakers et al. (2018) showed that better-off households in

Nigeria are able to afford healthier diets by purchasing vegetables, while a study on willingness to pay for vegetables in Lagos (Aboaba et al., 2022) revealed a positive association between income level and vegetable consumption. However, one-third (36%) of the statements also indicate that low-income consumers are inclined to buy vegetables because they are cheaper, as shown, for instance, in Tanzania (Chacha and Laswai 2020) and urban Nigeria (Aboaba et al., 2022).

Religious beliefs are also mentioned as a critical influence on dietary

practices: in the case of vegetables, the reported effects are often positive. For example, members of the Orthodox Church in Nigeria discussed how the church encourages its followers to consume fruits and vegetables (Odukoya et al., 2022). Similarly, in the Central Amhara Region of Ethiopia, it has been found that a higher level of religiosity is associated with increased consumption of fruit and vegetables (Kibr 2021).

Education is another key variable, accounting for most (85%) of the social institutions mentioned in most of the examined statements (85%). Generally, educated individuals are more likely to eat vegetables, as stated in one of the reviewed studies: “[...] as the years of formal education increase, the consumers tend to place more premium on carrots” (Etuah et al., 2022: 8). Only a few (15%) of the statements referring to the role of education suggest a negative effect: among them, Zulu et al. (2022) report that more educated people in parts of South Africa tend to opt for richer food over vegetables and fruits.

4.4. Types of vegetables

The analysis highlights a good deal of diversity in reports on the influence of social institutions on consumption practices according to vegetable types (Table 4). More statements relate to Traditional African Vegetables as compared to Exotic Vegetables. For instance, in terms of cultural norms, most (88%) of the statements are associated with traditional African vegetables, such as spider plant (*Cleome gynandra*), amaranth (*Amaranthus* spp), jute mallow (*Corchorus olitorius*), baobab leaves (*Adansonia digitata*), okra (*Abelmoschus* spp). In fewer (12%) of the selected statements, cultural norms affect the consumption practices of Exotic Vegetables, such as cabbages (*Brassica oleracea*), tomatoes (*Solanum lycopersicum*), onions (*Allium cepa*), chilis (*Capsicum annum*), carrots (*Daucus carota*), and cucumbers (*Cucumis sativus*).

Two-thirds of statements (67%) on personal perceptions and beliefs are associated with the consumption practices of Traditional African Vegetables. For example, while it is known that consumption of vegetables, such as carrots and pumpkin, is known to be beneficial to health and fetal development during pregnancy, examined articles report that in KwaZulu-Natal, women are not allowed to eat certain vegetables (e.i., bananas and pumpkin leaves), which are believed to negatively affect fertility (Mngomezulu et al. (2022). About one-third (33%) of the analyzed statements mention personal perceptions and beliefs in relation to the consumption of Exotic Vegetables, like cabbage, which tends to be associated with modern lifeways (Bvenura and Sivakumar 2017).

Three-fourths (75%) of selected statements that mention family and

kinship center on the consumption of Traditional African Vegetables, including amaranth (*Amaranthus* spp), slender leaf (*Crotalaria ochroleuca*), African nightshade (*Solanum nigrum*), jute mallow (*Corchorus olitorius*), etc. The rest (25%) refer to the consumption of Exotic Vegetables.

In terms of the role of wealth status in shaping consumption, the distribution is less skewed, with over half (54%) of the statements referring to Traditional African Vegetables (e.g., leaves of *Adansonia digitata*, *Bombax costatum*, *Sesamum radiatum*), and less than half of them mentioning Exotic Vegetables, such as *S. lycopersicum*, *C. sativus*, *D. carota*, etc.

5. Discussion

This study examined available literature on the effects of a range of social institutions in shaping vegetable consumption practices across Africa. We analyze this linkage through the lens of interactions across drivers stemming from different dimensions, including cultural norms (macrosystemic dimension), personal perceptions and beliefs, educational levels, and wealth status (individual dimension), family and kinship (social environment dimension). While based on secondary research, this finding aligns with existing empirical findings: for example, Van Rensburg et al. (2007) provides evidence that leafy vegetable consumption in sub-Saharan Africa is strongly linked to cultural traditions pertaining to food cultures that are specific to each ethnic group. For example, according to Atuna et al. (2022), okra consumption in Ghana is promoted as a healthy dietary choice. Similarly, Odukoya et al. (2023) found that communities in rural Nigeria believe that eating vegetables contributes to a healthy body. This perception is supported by empirical evidence about the health benefits of vegetable consumption, such as those due to their polyphenolic compounds (Alaluf et al., 2002; Bouilly-Gauthier et al., 2010).

The study reveals a general pattern of positive effects of education on vegetable consumption. However, we found low agreement among scholars about how wealth status influences vegetable consumption: for instance, a study in Tanzania shows that higher income status does not necessarily translate to greater vegetable consumption (Weinberger and Swai (2006). Rather, their research indicates that vegetables are more common in the diet of poor households, and similar patterns have been found in South Africa (Mncwango et al., 2020). On the other hand, in the United States, Sisson (2002) and Dong and Lin (2009) found that daily vegetable consumption is associated with higher income levels. This

Table 4
Distribution of the 320 statements across the articles.

Institutional category	Frequency (N of statements)	Relative importance of each institution (%)	Influence: Enabler (+) Barrier (-)	Frequency	Relative importance of the influence (%)
Religious norms	15	5	+	11	73%
			-	4	27%
Cultural norms	124	39	+	76	61%
			-	48	39%
Family and kinship	26	8	+	15	58%
			-	11	42%
Education	39	12	+	33	85%
			-	6	15%
Local CSO regulations	4	1	+	4	100%
			-	0	0%
Media	5	2	+	3	60%
			-	2	40%
Economic status	36	11	+	23	64%
			-	13	36%
Personal perception or belief	70	22	+	36	51%
			-	34	49%
Total	320	100			

suggests that efforts to promote vegetable consumption by supporting income generation or economic empowerment, without taking into account the sociocultural context, may fail to lead to desired outcomes.

The literature review also illustrates how the role of social institutions in enabling or hindering vegetable consumption varies by vegetable types or origins, whether traditional or exotic, and context. Cultural norms in African communities emerge as the most commonly researched institutions: valuation of vegetables in terms of health and nutritional benefits appear to play a key role in facilitating or hindering consumption (Atuna et al., 2022; Merchant et al., 2022).

These findings suggest that vegetable consumption practices are not culturally neutral and that a socio-institutional perspective - centered on understanding systemic influences, cultural norms, social identity and positioning, and personal perceptions and beliefs - must be integrated into programs aimed to promote healthy diets in Africa. This knowledge can guide agricultural extension programs and more contextualized strategies aimed to facilitate behavioural changes towards healthier diets.

In addition to showing how different studies emphasize the context-dependent nature of the influences of social institutions on vegetable consumption in Africa, our analysis indicates that such effects also vary across vegetable types (Table 4). Rather, the literature mentions Traditional African Vegetables more frequently than exotic species (introduced later into a socio-cultural context). This difference could be attributed to the relationship of African communities with the indigenous species that belong to their ecosystem (Pouliot and Treue 2013). Thus, for many generations, communities have used them and were able to generate local and indigenous knowledge around them, while Exotic Vegetables, which may have been introduced more recently and associated with urban and modern life in some places, have lower cultural value than Traditional African Vegetables hold (Dweba and Mearns, 2011). This finding points to the need for context-based strategies to stimulate vegetable intake while avoiding one-size-fits-all approaches.

Having screened out many of the 473 papers initially collected because they did not focus on Africa or vegetables, our review centered on 62 publications, which were selected according to the approach outlined in section 3. We recognize that there may be studies on the topic that have not been captured in this review, all the more so since we restricted our search to academic rather than grey literature.

6. Conclusion

The study explores the role of social institutions in shaping vegetable consumption practices in Africa by analyzing 62 academic papers covering fifteen African countries, thereby filling a knowledge gap and offsetting a technological bias in vegetable development programs. This review shows that multiple institutions interact in promoting or constraining vegetable consumption practices, including influences operating at the macro-system level (i.e., cultural norms) as well as the micro-level (i.e., personal perceptions and beliefs). We found that education has positive effects on vegetable consumption, but mixed results are found on the role of economic status. Social norms are mentioned as shaping consumption more often for traditional vegetables than exotic ones. The review also found fewer studies about the influence of local organizations, such as civil society entities and the media, on vegetable consumption in Africa, which offers possible directions for future research. A consideration of the role of social institutions, such as cultural norms and values, may enhance the effectiveness of food security and nutrition initiatives in promoting behavioural change and healthier diets.

CRedit authorship contribution statement

Edmond Totin: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Validation, Writing – original draft, Writing – review & editing. **Akouegnon**

Ferdinand Ayimasse: Data curation, Formal analysis, Methodology, Software, Visualization, Validation, Writing – original draft, Writing – review & editing. **Carla Roncoli:** Data curation, Methodology, Supervision, Validation, Writing – review & editing. **Pepijn Schreinemachers:** Supervision, Validation. **Mathieu A.T. Ayenan:** Data curation, Validation, Writing – review & editing. **Jody Harris:** Validation, Writing – review & editing.

Declaration of competing interest

We are considering the submission of our manuscript entitled “How has food systems research addressed the role of social institutions? A review of the literature on drivers of vegetable demand in Africa” for publication in *Agriculture and Human Values* as a review article. This manuscript is co-authored by Edmond, Ferdinand Ayimasse, Pepijn Schreinemachers, Carla Roncoli, Mathieu Ayenan, and Jody Harris. All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript. The authors have no affiliation with or involvement in any organization or entity with a direct or indirect financial interest in the subject matter discussed in the manuscript.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.gfs.2024.100775>.

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